

Money

Note: typically one equation represents quantity and the other reflects value.

1. A movie theatre sold twice as many adult tickets as student tickets. The total receipts were \$2299. If adult tickets cost \$7 and student tickets cost \$5, how many of each were sold? **[a=242, s=121]**
2. Thea's hockey team bought 70 pucks costing \$100. Practice pucks cost \$1.25 each and game pucks cost \$2.50 each. How many of each kind did she buy? **[p=60, g=10]**
3. Colin has \$10.15 in quarters and dimes. If the number of dimes is 8 more than three times the number of quarters, how many of each does he have? **[q=17, d=59]**
4. Phil has some \$2 bills and some \$5 bills worth a total value of \$81. If he replaced the \$2 bills with the same number of \$5 bills and the \$5 bills with the same number of \$10, he would have \$175. How many \$2 bills does he have? **[T=13, F=9]**
5. Paul invested \$5000, part at 7% per annum and the remainder at 6% per annum. After one year, the total interest from these investments was \$315. How much was invested at 7%? **[\$1500]**
6. Zen has \$31.00 consisting of \$2 coins and \$5 bills. If he has 11 bills in all, how many of each does he have? **[8 \$2, 3 \$5]**
7. A grade 1 class collected \$3.55 in nickels and dimes for the Red Cross. There were 56 coins in total. How many of each coin were there? **[d=15, n=41]**
8. Tony bought a new suit for \$185. He paid the bill using \$5 bills and \$10 bills. If there were 26 bills in all, how many \$5 bills did he use? **[T=11, F=15]**
9. A sum of \$7.40 is made up of quarters and dimes. If there are 10 more quarters than dimes, how many coins of each kind are there? **[d=14, q=24]**
10. Chris has 26 coins, consisting of quarters and dimes. If he has \$5.15 altogether, how many of each does he have? **[d=9, q=17]**
11. A parking lot contained 102 vehicles (cars and buses). Each car was charged \$3 and each bus \$10. The total revenue was \$418. How many buses were on the lot? **[16 buses]**
12. Eric and Josh bought a lottery ticket and won \$100,000. Since they paid different amounts for the ticket, Eric received \$10,000 more than twice what Josh received. How much money did they each receive? **[J=30000, E=70000]**
13. At Burgers and Shakes Tom placed an order for 6 burgers and 4 shakes and paid \$14, Rachel ordered 5 burgers and 2 shakes and paid \$10. Sam ordered 2 burgers and a shake. How much will Sam pay for his meal? **[\$4.25]**
14. Ben cashed a cheque for \$500 and received \$5 and \$10 bills. If the teller gave him 60 bills, how many \$5 bills did he receive? **[20]**

15. The AY Student's Council organized a dance. The ticket price for AY students was \$5.50 and guests was \$7.00. The total receipts were \$2175.00. If 375 students attended, how many of them were guests. [s=300, g=75]

Investment

16. Stacey invested \$12,000, partly in bonds at 8% per annum and the remainder in a second mortgage paying 9% per annum. After one year her total interest earned was \$1043. How much did Stacey invest at each rate? [3700, 8300]
17. Mary invested \$2000, part at 4% interest and part at 7%. If the interest on her investments totaled \$92, how much did she invest at each rate? [1600, 400]
18. From the yearbook receipts the student council deposited part of the \$1200 in a saving account receiving 9% interest per annum, and the rest in a chequing account receiving 4% per annum. If the total interest received for a year is \$88, how much money was deposited in each account? [400, 800]
19. The interest on Ruby's two investments totaled \$367. She had invested a total of \$3500, part at 11% and part at 10%. How much did she invest at each rate? [1700, 1800]
20. By investing \$5000, part at 8% and part at 9%. Terry received \$420 in interest. How much did he invest at each rate? [3000, 2000]
21. Keino invested \$200 and received \$13.50 in interest. Part of the initial investment was at an interest rate of 7%, the remainder was at 6%. How much did she invest at each rate? [150, 50]
22. Brian invested \$3500, part at 6% and part at 9% interest. The interest received at the higher rate was double the interest received at the lower rate. How much was involved at each rate? [1500, 2000]
23. Ann invested \$4000, part at 9% per annum and part at 12.5% per annum. The total interest, after one year, from these investments was \$458. How much was invested at each rate? [2800 at 12.5%]

Break-Even

24. The Kanata Minor Hockey Association would like to rent a banquet hall. They have received two quotes. Mike's Hall charges \$499 to rent the room, plus \$15 for each meal. Pam's Palace charges \$400 for the hall plus \$18 for each meal. Determine when each place will cost the same. [33 meals]
25. Guarantee Pool Repair charges \$50 for a service call, plus \$40/h for labour. Oasis Pools and Spas charges \$30 for a service call, plus \$45/h for labour. Find the length of the service call for which both companies will cost the same. [4 hours]
26. The City of Nepean recycles cardboard. It rents a baler to package the cardboard, which it sells to paper companies. The baling machine costs \$330 per month to lease and the wire costs \$4.20 per tonne of cardboard and labour costs are \$32.50 per tonne. The city sells the baled cardboard for \$42 per tonne. What is the break-even point? [60 tonnes]
27. Phoenix Club charges a \$200 initiation fee, plus \$15 a month. Champion Health Club charges a \$100 initiation fee, plus \$20 a month. If you joined for a year which club would you choose? [20, 500]

MPM2D**WORD PROBLEMS**

28. Jane plans to make a quilt. She can spend \$100 for material. The design requires a combination of two different fabrics totaling 25 m.
- Jane likes silk and satin, both cost \$10/m. What combination should she buy? **[no sol'n]**
 - She also likes cotton and rayon, both cost \$4/m. What combination of these could she buy? **[many sol'n]**
29. To raise money for a school reunion, students sell T-shirts. The cost of the T-shirts includes \$800 design and set-up charge plus \$4 per T-shirt. The T-shirts sell for \$20 each. Model the cost and revenue functions. How many shirts need to be sold to make a profit? **[more than 50]**
30. Dan's father is planning to buy a cellular phone and Dan is helping him to decide which service provider to get. Digicell charges \$20/month plus \$0.15 per minute. CanTalk charges \$25/month and \$0.08 per minute. Under what circumstances would Dan recommend each plan? **[71.4 min breakeven]**

Numbers and Age

31. Two numbers are such that 3 times the greater exceeds twice the smaller by 62. The sum of the numbers is 84. Find the numbers. **[s=38, g=46]**
32. Find 2 numbers so that their sum divided by 4 is 12. The first number if doubled and increased by 24, is equal to twice the other. **[18,30]**
33. The sum of two integers is -20. One integer is three times the other. Find the integers. **[-5, -15]**
34. Find two numbers such that twice the first number increased by the second number is 10, and the first number decreased by half the second number is 2. **[F=3, S=7/2]**
35. Find two numbers such that twice the first number equals three times the second number and the first number is equal to 5 less than four times the second number. **[3,2]**
36. The sum of two numbers is 46. When 30 is subtracted from 5 times the smaller, the result is 3 times the larger. Find the numbers. **[21,25]**
37. Five times the larger number of two numbers, increased by four times the smaller is 271. Three times the larger number exceeds twice the smaller by 57. Find the numbers. **[24,35]**
38. Find two numbers such that twice the first number equals three times the second number and the first number decreased by half the second number is 2. **[2,3]**
39. Two numbers are such that 3 times the greater is exceeds twice the smaller by 62. The sum of the numbers is 84. Find the numbers. **[38,46]**
40. The sum of the digits of a two-digit number is 11. The difference the numbers formed by reversing the digits is 27. Find the number. **[74]**
41. Pat is 3 times older than her dog. Four years ago, she was 7 times older. How old is her dog? **[D=6]**
42. Barry is 8 years older than his sister. In 3 years he will be twice as old as she will be then. How old is each person now? **[B=13, S=5]**

Mixtures

43. How many kilograms of 35% salt solution and 45% salt solution should be mixed to make 500 kg of 43% salt solution? **[100Kg 35%, 400Kg 45%]**
44. A storekeeper wishes to mix tea worth \$15/kg with tea worth \$19/kg to make 100 kg of tea worth \$17.20/kg. How many kilograms of each kind should he mix? **[45 kg at \$15, 55 kg at \$19]**
45. Mr. Belly mixes jelly beans at \$4/kg with saltwater taffy at \$8/kg resulting in a 100 kg candy mixture worth \$4.80/kg. How many kilograms of each candy are in the mixture? **[80 kg at \$4, 20 kg at \$8]**
46. A store owner sells peanuts at \$2.50/kg and cashews at \$6.00/kg. What amounts of each should she use to make up 10 kg of mixed nuts to sell at \$3.90/kg? **[6kg peanuts, 4kg cashews]**
47. One alloy of iron is 49% iron and another is 28% iron. How many tonnes of each alloy should be used to make 120 tonnes of 42% iron alloy? **[80-49% and 40-28%]**
48. Mixing 9% and 15% solution gives 300 mL of a 10% acid solution. How much of each solution must be used? **[9% 250ml, 15% 50 mL]**

Speed

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49. Monica left Montreal driving at 30 km/hr. Wendy left 2 hours later and traveled the same road at 40 km/hr. At what distance from Montreal will Wendy over take Monica. **[240 KM]**
50. Marco left Trout Creek driving at 40km/h. Rachel followed two hours later driving at 50 km/hr. How far down the road will Rachel overtake Marco?
51. A canoeist takes 5 hours to deliver a telegram to an outpost 85 km downstream. Returning upstream with the reply, the canoeist takes 1 hour to travel 10 km. What is the rate of the canoeist in still water? What is the rate of the current?
52. On a trip of 600 km, Zoe drove part of the way at 80 km/hr and the remainder at 90 km/hr. If the total trip took 7 hours, how far did she drive at each rate?
53. Bill drove for 5.5 hours, part of the time at 90 km/hr and part at 70 km/hr. He covered a distance of 445 km. How far did he drive at each rate?
54. A car covered a total distance of 205 km averaging a speed of 90 km/hr on highways and 85 km/hr on country roads. The trip took 3.5 hours. How many hours, and how many kilometers did the car travel on country roads.
55. Two persons, 18 km apart, setting out at the same time meet in 4.5 hours if they walk in the same direction, but in two hours if they walk towards each other. Find their rates of walking.
56. A commercial airliner traveled 4725 km with the wind in 4.5 hour and returned the same distance against the wind in 5.25 hours. Find its airspeed in still air and the wind velocity.

MPM2D**WORD PROBLEMS**

57. Five kilograms of tea and 8 kg of coffee cost \$158. The price of tea increases by 15% and that of coffee by 10%. The new cost for all 13 kg is \$175.70. What is the new price for 1 kg of tea and 1 kg of coffee?
[\$7.60 Tea, \$15 coffee]
58. The distance from Chesterville to Dorset is 560 km. The trip takes six hours. To get there, you travel along highway 401 where the driving speed is 100 km/hr and then along regional roads where the speed limit is 80 km/hr. How far along the 401 would you drive?
[400km]
59. In a running -swimming race, Joe ran at 12 km/hr and swam at 3 km/hr. He finished the race in 1.75 hours and traveled 16.5 km. How far did he run?
[15 km running]
60. As a part of her physical fitness training. Brenda cycled at 30 km/hr and then jogged at 8 km/hr. The total time spent was 2 hours and she covered a total distance of 49 km. How long did she spend jogging?
[0.5 hours jogging]
61. A boat travels 20 km upriver in 3 hour and 20 minutes and returns in 2 hours. Find the speed of the current.
[current speed is 2km/hr]
62. Ms. V walked a certain distance, then returned along the same route. She walked 10 km/hr going and 8 km/hr returning. How far did she walk if the return trip took 9 hours?